CLAIMS:

1. A method of measuring an apparent depth of a section of an animal body, the section being defined by first and second interfaces, comprising the steps:

a) focusing an incident beam of light to a plurality or continuum of measurement locations along a measurement line passing through the section, the measurement line being generated by an optical element adapted to provide an extended focal region, such that incident light is focused to all measurement locations along the measurement line concurrently;

b) detecting light reflected from at least one of the plurality of measurement locations when a respective interface is coincident therewith;

c) generating at least a first and a second signal representative of the detected light reflected from the first and second interfaces respectively; and

d) deriving from the first and second signals the apparent positions of the first and second interfaces.

2. The method of claim 1, wherein the section is the aqueous humor of an eye and the apparent depth is an optical path length through the aqueous humor.

3. The method of claim 2, wherein the first interface is a surface between the cornea and the aqueous humor of the eye and the second interface is a surface between the aqueous humor and the ocular lens of the eye.

4. The method of either of claim 2 or claim 3, further comprising the step of comparing the derived apparent depth with a previous reference measurement of the apparent depth,

so as to determine a change in the refractive index of the aqueous humor.

5. The method of claim 4, further comprising the step of calculating a measure of change in a concentration of glucose within the bloodstream of a patient from the change of refractive index.

6. The method of any preceding claim, wherein the detected light is arranged to comprise substantially only light which has been focused to a measurement location and reflected by an interface coincident therewith.

7. The method of any preceding claim, wherein the optical element is a diffractive, wavelength-spreading device and the wavelength of light focused to each successive measurement location along the measurement line varies according to distance from the optical element.

8. The method of claim 7, wherein the wavelength-spreading device comprises one of a Fresnel zone plate or an element adapted to provide a surface relief diffractive effect.

9. The method of either of claims 7 or 8, wherein reflected light is detected by means of a diffraction grating and a linear detector array, the reflected light from each measurement location reaching a different location on the linear detector array.

10. The method of either of claims 7 or 8, wherein reflected light is detected by means of an etalon, comprising first and second plates, and a detector, the distance between the first and second plates of the etalon determining the wavelength of reflected light received by

the detector, such that a range of wavelengths of light corresponding to measurement locations having a respective interface coincident therewith may be detected by scanning the first and second plates relative to one another.

11. The method of any of claims 1 to 6, wherein the optical element is an axicon lens.

12. The method of any of claims 1 to 6 and 11, wherein reflected light is detected after being received at a pinhole aperture, adapted to be translatable through a range of positions confocal with respective ones of the plurality of measurement locations, such that light reflected from ones of the measurement locations having a respective interface coincident therewith may be detected by scanning the pinhole aperture through the range.

13. The method of any one of claims 1 to 6 and 11 or 12, further comprising the step of generating light having two or more wavelengths, such that two or more properties of the eye may be measured.

14. An apparatus for measuring an apparent depth of a section of an animal body, the section being defined by first and second interfaces, comprising:

a) an optical focusing assembly, comprising an optical element adapted to provide an expanded focal region, the optical focusing assembly being adapted to focus an incident beam of light to a plurality or continuum of measurement locations along a measurement line passing through the section, such that incident light is focused to all measurement locations along the measurement line concurrently;

b) a detector assembly, adapted to detect light reflected from at least one of the plurality of measurement locations when a respective interface is coincident therewith and to generate a signal representative of that detected light; and

c) a processor in communication with the detector assembly and adapted to receive from the detector assembly first and second signals corresponding to detected light reflected from the first and second interfaces respectively and to derive therefrom apparent positions of the first and second interfaces.

15. The apparatus of claim 14, wherein the processor is further adapted to compare the derived apparent depth with a previous reference measurement of the apparent depth, such that a change in the refractive index of the section may be determined.

16. The apparatus of either of claim 14 or claim 15, wherein the optical element is a diffractive, wavelength-spreading device and the wavelength of light focused to each successive measurement location along the measurement line varies according to distance from the optical element.

17. The apparatus of claim 16, wherein the wavelength-spreading device comprises one of a Fresnel zone plate or an element adapted to provide a surface relief diffractive effect.

18. The apparatus of either of claim 16 or claim 17, wherein the detector assembly comprises a diffraction grating and a linear detector array, the reflected light from each measurement location being arranged to reach a different location on the linear detector array.

19. The apparatus of either of claim 16 or claim 17, wherein the detector assembly comprises an etalon, comprising first and second plates, and a detector, the distance between the first and second plates of the etalon determining the wavelength of reflected light received by the detector, such that a range of wavelengths of light corresponding to measurement locations having an interface coincident therewith may be detected by scanning the first and second plates relative to one another.

20. The apparatus of either of claims 14 or 15, wherein the optical element is an axicon lens.

21. The apparatus of any of claims 14, 15 or 20, wherein the detector assembly comprises a pinhole aperture and a detector, the pinhole aperture being adapted to be translatable through a range of positions confocal with respective ones of the plurality of measurement locations, such that light reflected from one of the measurement locations having a respective interface coincident therewith may be detected by scanning the pinhole aperture through the range.

22. The apparatus of any of claims 14 to 21, further comprising a light source, adapted to produce the incident beam of light and being further adapted such that the light has one of a substantially single wavelength; a plurality of substantially discrete wavelengths; or a continuous range of wavelengths.

23. A method of measuring an apparent depth of a section of an eye comprising analysing an intensity-position profile of light reflected concurrently from the section of the eye.

24. A micro-electromechanical system, comprising the apparatus of any one of claims 14 to 22.

25. A hand-held device, comprising the apparatus of any one of claims 14 to 22 or the micro-electromechanical system of claim 24.

26. An apparatus for measuring a property of a component of an animal body substantially as herein described with reference to the accompanying drawings.

27. A method of measuring a property of a component of an animal body substantially as herein described with reference to the accompanying drawings.

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